LINEAR ALGEBRA – MATH3110 - 003
SPRING 2021
MWF 12:20 – 1:10pm – Daniel 100B

**Due to our current situation, things can change throughout the semester. Therefore, the instructor reserves the right to modify this syllabus, if needed, to adjust the learning environment with the situation. You will be notified each time that happens.*

Instructor

Dr. Cynthia Ramiharimanana
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Office Hours (zoom link in Canvas): MWF 1:30 – 2:30pm or by appointment

Teaching Assistants

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Modality

This course is a hybrid/blended course which is a traditional classroom-based course. Lectures will be delivered synchronously. Online-only students and students on their non-assigned days should attend classes via zoom (please check your Clemson app for your assigned day).

Course Description

This course will be an introduction to Linear Algebra at the undergraduate level. We will concentrate on the mathematical theory and methods of linear algebra as well as discuss some applications. Engineering and science students will have a solid base of understanding in elementary linear algebra as required for further undergraduate work in those fields and Math students will be prepared for a more formal and rigorous linear algebra course. Schedule will be posted on canvas on a weekly basis.

Learning Outcomes

After successfully completing the course, each student is expected to:

- be able to solve systems of linear equations through elimination
- be able to perform matrix algebra; compute determinants; find eigenvalues and eigenvectors; and to diagonalize

- understand linear transformations and apply their properties
- be able to carry out operations in vector spaces; to connect the concepts of independence, basis, and dimensions
- be able to define the column space, row space, and null space of a matrix
- compute Eigenvalues and Eigenvectors
- understand the concept of orthogonality of vectors and its use in projecting vectors into subspaces
- understand how to solve constrained systems using the method of least squares
- be able to apply the concepts to solve problems in mathematics, engineering …

Tentative Topical Outline

- Solving Linear Systems through elimination
- Vectors: Linear independence
- Linear Transformations: matrix
- Matrix Algebra: Operations, Inverses, Characterizations of Invertible matrices, Determinants
- Vector Spaces, Subspaces, Basis, Rank-Nullity Theorem
- Eigenvalues and Eigenvectors
- Orthogonality and Least Squares: Gram-Schmidt Process, Least-Square Problems
- Applications

Prerequisite

Calculus of One Variable II (MATH1080) with C or better.

Required materials

- Textbook: *Linear Algebra and Its Applications*, 5th edition, By D. C. Lay, S. R. Lay, and J. J McDonald
- Online Homework Platform: MyLabMath (registration instruction will be provided). If you purchase your materials from the bookstore, MyLab Math comes bundled with the textbook. Alternatively, purchase only MyLab Math from the bookstore and use the online version of the text accessible from MyLab Math.
- Computer, Webcam and microphone (could be integrated to other devices), smartphone

Assessment Activities

- Learning activities: which will be given regularly at the end of classes. Students will work on problems related to the day's topics which will be turned in electronically for credit (use for example the app CamScanner for scanning).
- Homework (MyLabMath): homework will accumulate from lecture to lecture, and all must be completed to receive a grade for the course.
- Exams: there will be two midterm exams and a final exam.

Grading Polices

Late Work: students who for good reason must submit an assessment activity late must inform the instructor via canvas early enough. Every missed assessment without justification will receive zero.

Final exam (cumulative) – will be mandatory and you must obtain at least D at it to pass this class.

The final grade will be calculated as follows:

- Homework: 10%
- Learning activities: 10%
- Midterm 1: 25% - Midterm 2: 25%
- Final exam (cumulative/mandatory): 30%

Grading scheme: A ≥ 90% > B ≥ 80% > C ≥70% > D ≥ 60% > F

Exam dates & Proctoring

Proctoring – will be communicated on canvas.

Tentative Dates

- Exam 1 – 02/12th
- Exam 2 – 03/29th
- Final Exam – 04/27th – 3:00-5:30pm

Instructor & Course Policies

Waiting time

If the instructor has not arrived within 10 minutes of the scheduled class time, you may assume that class has been canceled.

Attendance

From the undergraduate academic regulation for Clemson "Class attendance is critical to the educational process; therefore, students should attend scheduled courses regularly if they are to attain their academic goals".

Attendance will be required. Students who have enrolled for In-person are expected to attend class on their assigned days and use zoom for the other days. Students who have enrolled for Online-only are expected to attend each class via zoom (details will be posted on canvas). A student with an excessive number of absences may be withdrawn at the discretion of the instructor. **Students should use the Notification of Absence module in Canvas, or other**

reasonable means, to notify the instructor of a future absence from class. In the event of an emergency, the student should make direct contact with the instructor, preferably before a class or an exam takes place. Students should speak with the instructor regarding any scheduled absence as soon as possible and develop a plan for any make-up work. While infection or possible exposure to COVID-19 will require a student to isolate or quarantine, students who are able are expected to continue to engage in their classes online. Students who are attending in-person classes in traditional or hybrid/blended courses and who are not approved to be online for all their spring semester courses are expected to return to in-person attendance once cleared by the University. Attendance will be used to decide grades in borderline cases.

Email Response Time

You can expect a response to your email inquiries within 24 hours, excluding weekends and university holidays.

Assignments/Tests due to inclement weather

Any exam that was scheduled at the time of a class cancellation due to inclement weather, University power outage, etc. will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless the instructor contacts students. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather-related cancellation.

University Policies

Specific COVID-19 related information for in-person classes

While on campus, face coverings are required in all buildings and classrooms. Face coverings are also required in outdoor spaces where physical distance cannot be guaranteed. Please be familiar with the additional information on the Healthy Clemson website, such as the use of wipes for in-person classes. If an instructor does not have a face covering or refuses to wear an approved face covering without valid accommodation, students should notify the department chair. If a student does not have a face covering or refuses to wear an approved face covering without valid accommodation, the instructor will ask the student to leave the academic space and may report the student's actions to the Office of Community & Ethical Standards as a violation of the Student Code of Conduct. If the student's actions disrupt the class to the extent that an immediate response is needed, the instructor may call the Clemson University Police Department at 656-2222.

Student Accessibility Services

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible.

You can make an appointment by calling 864-656-6848or by emailing studentaccess@lists.clemson.edu. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/.

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a "high seminary of learning. "Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.

Non-Discrimination

Clemson University is committed to providing a higher education environment that is free from sexual discrimination. Therefore, if you believe you or someone else that is part of the Clemson University community has been discriminated against based on sex, or if you have questions about Title IX, please contact the Title IX Coordinator, Alesia Smith, who also serves as the Executive Director of Equity Compliance, at 110 Holtzendorff Hall, 864-656-3181 (voice) or 864-656-0899 (TDD). The Title IX Coordinator is the person designated by Clemson University to oversee its Title IX compliance efforts. Please consult the University's Title IX policy for full details.